Methodology for Evaluation Quality in Higher Education

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Abstract: The quality represents the different characteristics of an entity that gives fitness to meet the needs expressed or implied. Quality management in higher education is a basic requirement of orientation towards performance and increase competitiveness of universities, considering that, as an institution of education and research, assumes the responsibility to form competent specialists, to answer the needs of the labor market, to develop the scientific fundamental and applicative research in accordance with national and international standards and to integrate into the university system of the European Union. The need to optimize the activity of the universities, the implementation of efficient management, quality assurance and education systems committed on roadmap has led to numerous researches in this field by adopting the theoretical framework of reference, organizational patterns of explanation of the functionality of universities and the definition of a system of performance assessment.

Keywords: academic prestige; selectivity; performance; competitiveness

1. Introduction

Romanian universities are currently in a deep transformation process, adjusting in line with trends in higher education internationally. They tend to respond to an ever-growing measure of superior training needs and to shape the activity in accordance with the economic and social realities.

International and European performances in a row, characterized by increasing accent put on the relevance of the University educational institutions have Romanian formulated a clear position regarding their long-term mission and relevance that they want to achieve relevance, regional, national, European or international in terms of keeping or renouncing to their progressive (Dinca & Korka, 2001).

In terms of the significance of the University to society, it should be noted that in addition to its role as a major cultural, intellectual exercise through creative, this is also a service provider organization. The products offered are knowledge and

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competency provided the world in various forms: training of specialists in specific areas, research, consultancy, expertise, academic community member's involvement in the life of society (Korka, 2002). The University's main client is the society, represented by central government institutions and local administration, companies, institutions and organizations specializing in the management of the labor market. Students have a double quality: of active participants in the process of education and University clients. Other partners (interested parties) are: outside educational institutions, the academic community and national and international scientific and inside staff and University Administration (Stanciu, 2003). Rating system described below is based on five groups of indicators, according to the data in table 1, was centered on the assessment of the extent to which the universities have implemented the reform (Panaite, 2000).

Table 1. Groups of indicators used in the evaluation of activity of universities

Indicator (contributor)	Share
Academic prestige	25%
Selectivity of University students and the attractiveness	15%
Human resource management	25%
Scientific research, graduate, master and PhD	20%
The performance of students and graduates	15%
TOTAL	100%

To determine the values of qualitative indicators on the universities, were analyzed by two universities in Romania, namely:

Polytechnic University Timisoara (UPT);

University of Medicine and Pharmacy Craiova (UMF).

2. Introducing and Applying a Methodology of Romanian Universities Ranking

2.1. The Value of Qualitative Indicators Dashboard on Universities

2.1.1. Academic Prestige

IC1 – The share of teacher's leaders in total posts filled with holders

$$IC1 = \frac{NCD}{TP} * 100$$

NCD = number of Heads

TP = total titular teaching staff

$$\Rightarrow \text{IC1 UPT} = \frac{179}{166} * 100 = 20{,}67\%$$

$$\text{IC1 UMF} = \frac{44}{381} * 100 = 11{,}55\ \%\ .$$

IC2 - The intensity of international collaborations, the calculated average values on the Faculty

IC2.1 – The intensity of its staff to visit universities in collaboration

$$IC2.1 = \frac{[(VPp * k) / NPD]}{NF}$$

VPp = number of visits of staff at universities in

collaboration

NPD = total number of teaching posts legally constituted

NF = number of faculty

k=1 for visits up to 7 days

k=2 for visits between 7-30 days

k=3 for visits more than 30 days

$$\text{IC2.1 UPT} = \frac{[(4652 * 1 + 3561 * 2 + 266 * 3) / 866]}{9} = \frac{12306 / 866}{9} = 1{,}58 \rightarrow$$

minimum score

IC2.1 UMF = $\frac{[(2381*1+1843*2+17*3)/381]}{4} = \frac{6118/381}{4} = 4{,}01 \rightarrow$ maximum score

IC2.2 – The intensity of foreign partners in the visits private University

IC2.2 = $\frac{VPs * k}{NF}$, where VPs = number of visits of foreign partners in private University

IC2.2 UPT = $\frac{(7*1+9*2+3*3)}{9} = \frac{34}{9} = 3, 78 \rightarrow$ maximum score

IC2.2 UMF = $\frac{(7*1+1*2+1*3)}{4} = \frac{12}{4} = 3 \rightarrow$ average score

IC3 – The share of foreign students and PhD students in total students and doctoral students of the University's own

$$IC3 = \frac{SDs}{TSDday} * 100$$

SDs = the number of foreign students and PhD students in total students and doctoral students of the University

TSDday = total students and doctoral students at day universities.

$\Rightarrow$ IC3 UPT = $\frac{162}{13538} \times 100 = 1, 2\ \%$

IC3 UMF = $\frac{369}{2833} * 100 = 13, 02\ \%$.

IC4 – The share of students and PhD students admitted to universities abroad in total students and doctoral students at day universities

$$IC4 = \frac{SDas}{TSDday} * 100$$

SDas = the number of students and PhD students admitted to universities abroad

TSDday = total students and doctoral students at day universities.

IC4 UPT = $\frac{689}{13538} * 100 = 5, 09\%$

IC4 UMF = $\frac{113}{2833} * 100 = 3, 99\ \%.$

2.1.2. Selectivity of Students

IC5 – The ratio between the number of candidates registered for the first session of the exam for admission into the current academic year and the number of candidates admitted as students

IC5 = $\frac{NCI}{NCA}$ where NCI = the number of candidates registered for the first session of the exam for admission into the current academic year;

NCA = the number of candidates admitted as students.

$\Rightarrow$ IC5 UPT = $\frac{3034}{1785} = 1,7$

IC5 UMF = $\frac{576}{432} = 1,33.$

IC6 – Media notes to the BAC exam for candidates admitted.

IC6 = $\frac{\sum medii}{NCA}$

$\Rightarrow$ IC6 UPT = $\frac{14797,65}{1785} = 8, 29$; IC6 UMF = $\frac{3382,56}{432} = 7,83.$

IC7 – The share of students with fee in total students

IC7 = $\frac{Sfee}{TS} *100$

Sfee = the number of students with fee;

TS = total number students;

IC7 UPT = $\frac{2998}{13603} * 100 = 22, 03\ \%$

$$\text{IC7 UMF} = \frac{1045}{2878} * 100 = 36{,}3\% .$$

2.1.3. Human Resource Management

IC8 – The share of teaching posts filled with holders in total legally established posts

$$\text{IC8} = \frac{TP}{NPD} * 100$$

TP = Total number of teaching staff, with book holder and base rule in the University;

NPD = total number of teaching posts, legally constituted.

$$\text{IC8 UPT} = \frac{866}{1154} * 100 = 75,\ 04\%$$

$$\text{IC8 UMF} = \frac{381}{485} * 100 = 78,\ 56\ \%$$

IC9 – Professors and associate professors shareholders in all teaching staff with the basic rule in the University

$$\text{IC9} = \frac{P + C}{TP} * 100$$

P = number of associate professors;

C = number of professors;

$$\text{IC9 UPT} = \frac{339}{866} * 100 = 39,\ 15\%;$$

$$\text{IC9 UMF} = \frac{121}{381} * 100 = 31{,}76\ \%$$

IC10 – The share of regular teachers under 35 years in total teaching staff with the basic rule in the University

$$\text{IC10} = \frac{PD < 35}{TP} * 100 \Rightarrow \text{IC10 UPT} = \frac{287}{866} * 100 = 33,\ 14\%$$

IC10 UMF= $\frac{150}{381} * 100 = 39, 37\ \%$.

IC11 – The share of staff with the scientific title of doctor in total regular staff with the basic rule in the University

$$IC11 = \frac{PDd}{TP} * 100$$

PD<35 = tenured teaching staff number under 35 years;

$$IC11\ UPT = \frac{412}{866} * 100 = 47, 58\%$$

$$IC11\ UMF = \frac{44}{381} * 100 = 11,55\ \%$$

IC12 – Using the efficiency of the administrative and teaching staff through the curriculum and structure design on specializations and working groups

IC12.1 – The number of students interchangeable at a teaching post

$$IC12.1 = \frac{N_i^e}{TP}$$

$$N_i^e = \sum_{k=1}^{n} N_{ik} * e_k$$

N_i^e = the number of students interchangeable in the field Di;

Nik = the number of students physical in the field Di, educational form Fk on 1 January of the current year;

ek = the appropriate form of educational equivalence Fk.

N_i^e UPT = 10154*1 + 1213*1 + 597*3 + 433*6 1003*1,25 + 138*4 + 851*1 + 112*0,4 + 1400*0,12 + 203*1,25 +153*6 = 19797,3

$$IC12.1\ UPT = \frac{N_i^e}{TP} = \frac{19797,3}{866} = 22,86$$

N_i^e UMF = 2728*1 + 64*3 + 41*4 + 564*1 + 86*1,25 + 2642*3 + 641*2,1 = 13027,6

IC12.1 UMF = $\frac{N_i^e}{TP} = \frac{13027,6}{381}$ = 34, 19

IC12.2 – The number of interchangeable students at a teaching post auxiliary and TESA

IC12.2 = $\frac{N_i^e}{PD_a}$

PDa = number of auxiliary teaching staff and TESA;

IC12.2 UPT = $\frac{19797,3}{305+328} = \frac{19797,3}{633}$ = 31,28

IC12.2 UMF = $\frac{13027,6}{97+75} = \frac{13027,6}{172}$ = 75,74

IC13 – The share of managerial staff (academic and administrative) contained in specific training programs

IC13 = $\frac{PC_{pi}}{TP_c} * 100$

PCpi = senior staff in specific training programmes.

IC13 UPT = $\frac{68}{104} * 100$ = 65, 38 %

IC13 UMF = $\frac{19}{28} * 100$ = 67, 86 %

IC14 – Expenditures for training, specialization, qualification of employees at a busy teacher

IC14 = $\frac{CH_{cp}}{TP}$

CHcp = expenses for training, specialization, qualification of employees at a busy teacher.

IC14 UPT = $\frac{1050000}{866}$ = 1212, 47 RON

IC14 UMF = $\frac{1508000}{381}$ = 3958 RON

2.1.4. Scientific Research

IC15 – The share of students from the post-graduate education studies, master's and doctorate aprodundate in total physical education students of the day

IC15 = $\frac{SP_{bug} + SPfee}{TS_{bug} + TSfee} * 100$

SPbug = the number of students from the postgraduate education, aprof/master degree and PhD in finance budget;

SPfee = the number of students at postgraduate of Advanced Studies/masters and PhD programs, the students with the charge;

TSbug = the total number of students in University physical education, finance from the budget

TSfee = the total number of physical students University education, with fee.

IC15 UPT = $\frac{(424+348)+(173+641)}{(9180+1001)+(2277+548)} * 100 = \frac{1586}{13006} * 100 = 12, 19\%$

IC15 UMF = $\frac{(18+368)+(46+237)}{1729+999} *100 = \frac{669}{2728} * 100 = 24, 52\ \%$

IC16 – Unit annual revenue derived from scientific research on teaching

IC16 = $\frac{VCS}{TP}$

VCS - Income from scientific research, consultancy, expertise, in million lei;

IC16 UPT = $\frac{30000000}{866}$ = 34 642 lei / tenured teacher

IC16 UMF = $\frac{3000000}{381}$ = 7 874 lei / tenured teacher

IC17 – Annual revenue derived from scientific research, in million on the Faculty

$$IC17 = \frac{VCS}{NF}$$

$$IC17\ UPT = \frac{30000000}{9} = 3\ 333\ 333,\ 33\ lei/faculty$$

$$IC17\ UMF = \frac{3000000}{4} = 750\ 000\ lei/\ faculty$$

IC18 - The ratio between the number of PhD students and number of physical students from the university education with frequency in the year in question

$$IC18 = \frac{Nrdrd}{TSday}$$

Nrdrd = the number of PhD students;

Tsday = the number of physical students in University education with frequency in the current year.

$$IC18\ UPT = \frac{989}{11367} = 0,087$$

$$IC18\ UMF = \frac{605}{2728} = 0,\ 22.$$

2.1.5 The Performance of Students and Graduates

IC19 – The proportion of graduates with graduation examination of the number of registered students in the first year, in the promotion

$$IC19 = \frac{TNA}{NI} * 100$$

TNA = the number of graduates with Bachelor exam;

NI = the number of registered students in the first year, in the promotion;

$$IC19\ UPT = \frac{1438}{1785} * 100 = 80\%$$

$$\text{IC19 UMF} = \frac{284}{343} * 100 = 82,8$$

IC20 - The share of graduates accepted to continue studies in postgraduate and doctoral education in University or in other universities

$$\text{IC20} = \frac{NAP}{TNA} * 100$$

NAP = number of graduates accepted to continue studies in postgraduate and doctoral education in University or other universities;

TNA = total number of graduates.

$$\text{IC20 UPT} = \frac{623}{1438} * 100 = 43,32\ \%$$

$$\text{IC20 UMF} = \frac{197}{284} * 100 = 69,37\ \%$$

IC21 – The share of graduates in the last two promotions, employees in a post under the scope graduated

$$\text{IC21} = \frac{NA_{ad}}{NA_N + NA_{N-1}} * 100$$

NAad = the number of graduates employed in a post under the scope graduated;

NAN = number of graduates in the current academic year

NAN-1 = number of graduates from the previous academic year.

$$\text{IC21 UPT} = \frac{1526}{1046+1438} * 100 = \frac{1526}{2484} * 100 = 61,43\ \%$$

$$\text{IC21 UMF} = \frac{383}{261+284} * 100 = \frac{383}{545} * 100 = 81,28\ \%$$

IC22 – The share of graduates in the last two promotions, employees in a post irrespective of the field completed

$$\text{IC22} = \frac{NA_{id}}{NA_N + NA_{N-1}} * 100$$

NAid = number of graduates employees on a post irrespective of the field completed.

$$\text{IC22 UPT} = \frac{2126}{1046+1438} * 100 = \frac{2126}{2484} * 100 = 85,59\ \%$$

$$\text{IC22 UMF} = \frac{536}{261+284} * 100 = \frac{536}{545} * 100 = 98,35\ \%$$

2.2. Ranking of Universities that have made The Subject of a Case Study by Groups of Indicators

After calculating all indicators of quality values, proceed to determine the related score to each group of indicators, based on existing information in annex.

Table 2. The related score group of indicators Academic Prestige

No crt. of universities	The name General indicators	1. Academic Prestige					
	The share of General indicators	20%					
	The analytical evaluation indicators	IC1	IC2		IC3	IC4	TOTAL SCORE1
			IC2. 1	IC2 . 2			
	Analytical indicators share in Group	40%	15%	15 %	15 %	15%	
	The share of the total analytical indicators	8,00	3,00	3,0 0	3,00	3,00	
1.	"Politehnica" University of Timisoara	4	0	4	2	3	59
2.	UMF Craiova	2	4	3	4	2	55

Total score UPT = 8*4 + 3*0 + 3*4 + 3*2 + 3*3 = 32 + 12 +6 + 9 = 59

Total score UMF = 8*2 + 3*4 + 3*3 + 3*4 + 2*3 = 16 + 12 + 9 + 12 + 6 = 55

Table 3. The related score group of indicators selectivity of students and the attractiveness of the university

No crt. of universities	The name General indicators	2. Selectivity of students and the attractiveness of the university			
	The share of General indicators	10%			
	The analytical evaluation indicators	IC5	IC6	IC7	TOTAL SCORE 2
	Analytical indicators share in Group	35%	30%	35%	
	The share of the total analytical indicators	3,5	3	3,5	
1.	"Politehnica" University of Timisoara	1	2	4	23,5
2.	UMF Craiova	0	2	4	20

Total score UPT = 3, 5*1 + 3*2 + 3, 5*4 = 3, 5 + 6 + 14 = 23,5

Total score UMF = 3, 5*0 + 3*2 + 3, 5*4 = 6 + 14 = 20

Table 4. The related score group of indicators Human resource management

No crt. of universities	The name General indicators	3. Human resource management								
	The share of General indicators	20%								
	The analytical evaluation indicators	IC 8	IC 9	IC 10	IC 11	IC12		IC1 3	IC1 4	TOTAL SCORE 3
						IC1 2.1	IC1 2.2			
	Analytical indicators share in Group (%)	20	20	10	10	20	5	5	10	
	The share of the total analytical indicators	4,00	4,00	2,00	2,00	4,00	1,00	1,00	2,00	
1.	"Politehnica" University of Timisoara	4	4	3	4	2	2	3	1	61
2.	UMF Craiova	4	4	3	1	0	2	3	2	49

Total UPT = 4*4 + 4*4 + 2*3 + 2*4 + 4*2 + 1*2 + 1*3 + 2*1 = 61

Total UMF = 4*4 + 4*4 + 2*3 + 2*1 + 4*0 + 1*2 + 1*3 + 2*2 = 49

Table 5. The related score group of indicators Scientific research

No crt. of universities	The name General indicators	4. Scientific research				
	The share of General indicators	15%				
	The analytical evaluation indicators	IC15	IC16	IC17	IC18	TOTAL SCORE 4
	Analytical indicators share in Group	25%	20%	20%	35%	
	The share of the total analytical indicators	3,75	3	3	5, 25	
1.	"Politehnica" University of Timisoara	1	3	3	0	21,75
2.	UMF Craiova	3	1	0	1	19,5

Total score UPT = 3, 75*1 + 3*3 + 3*3 + 5.25*0 = 3, 75 + 9 + 9 = 21, 75

Total score UMF = 3, 75*3 + 3*1 + 3*0 + 5, 25*1 = 11, 25 + 3 + 5, 25 = 19, 5

Table 6. The related score group of indicators. The performance of students and graduates

No crt. of universities	The name General indicators	5. The performance of students and graduates				
	The share of General indicators	10%				
	The analytical evaluation indicators	IC19	IC20	IC21	IC22	TOTAL SCORE 5
	Analytical indicators share in Group	25%	25%	25 %	25%	
	The share of the total analytical indicators	2,5	2,5	2,5	2,5	
1.	"Politehnica" University of Timisoara	3	4	2	3	30
2.	UMF Craiova	3	4	3	4	35

Total score UPT = 2,5*3 + 2,5*4 + 2,5*2 +2,5 * 3 = 7,5 + 10 + 5 + 7,5 = 30

Total score UMF = 2,5*3 + 2,5*4 + 2,5*3 + 2,5*4 = 7,5 + 10 + 7,5 + 10 = 35

Further, on the basis of the scale for evaluation of institutional performance can be achieved the ranking of universities which have been the subject of case study groups of indicators and the types of universities.

With the difference that the ranking is partial, given the purely didactic character of the study, are repeated below the score obtained by universities, based on the information available, for each of the five groups of indicators.

Table 7. The score obtained by universities for each of the five groups of indicators

Group of indicators	Scores for each of the universities		Share to maximum possible score for the indicators considered (PMAX = 380)	
	UPT	UMF	UPT	UMF
Academic prestige	59	55		
Selectivity of students and the attractiveness of the university	23,5	20		
Human resource management	61	47		
Scientific research	21,75	19,5		
The performance of students and graduates	30	35		
TOTAL SCORE	195,25	176,5	51,38 %	46,45 %

In column 3 of table 8 is shown the score for each share of universities from the maximum score possible for the quality indicators considered (Pmax = 380).

Results so that there is no University that differentiates or net terms of performance indicators at all take into consideration.

The maximum score received by one of the universities analyzed is 195,25, which represents only the max score 51,38% possible. Getting the maximum score (100%) would imply that the University is the best performance in all indicators of quality.

3. Conclusions

Through the system of ranking presented and applied in this work, it was found that, although the three universities that have made the subject of a case study is academic prestige, none of which has reached the maximum score possible for the quality indicators considered. From here, the result is that there is no universal to distinguish net in terms of performance indicators at all take into consideration. The maximum score received by one of the universities analyzed is 195, 25, which

represents only 51, 38% of the maximum score possible. In this regard, the main strategic directions of educational policy would be halting the decline of quality and ensuring quality education.

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Annex 1. Structure and Dynamics of the Teaching Posts, Auxiliary Didactic and Nedidactic for the Universities Realized the Case Study

University	No. of faculty	No. teaching posts			Professors and lecturers		Teaching staff under 35 years		Leaders of teachers		The staff with scientific title of doctor		No personal TESA		Senior staff	Senior staff in special training programs	
		Total	occupied	Vacations	Total	%	Total	%	Total	%	Total	%	Auxiliary didactic	Non-didactic	Total	Total	%
UPT Timisoara	9	1154	866	288	339	39,15	287	33,14	179	20,67	412	47,58	305	328	104	68	65,38
UMF Craiova	4	485	381	104	121	31,76	150	30,97	44	11,55	238	62,47	97	75	28	19	67,86

Annex 2. The number of students at 01.01.2012, academic year 2011/2012

Educational form	Daily courses	PhD day (stage 4)	PhD and very helpful (stage 6)	Education at distance	Graduates 2011 -2012					Postgraduate specialization	Studies with charge	Residency	Total students
					University education	Advanced and master	Other postgraduate programs	PhD. day	PhD. F.F.				
Nr. col.	1	2	3	4	5	6	7	8	9	10	11	12	13 =1+4
UPT	13400	138	851	203	1438	301	157	3	69	153	977	-	**13603**
UMF	2792	41	564	86	284	73	82	33	57	2642	728	641	**2878**